

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International publication date
21 October 2004 (21.10.2004)

PCT

(10) International publication number
WO 2004/090453 A1

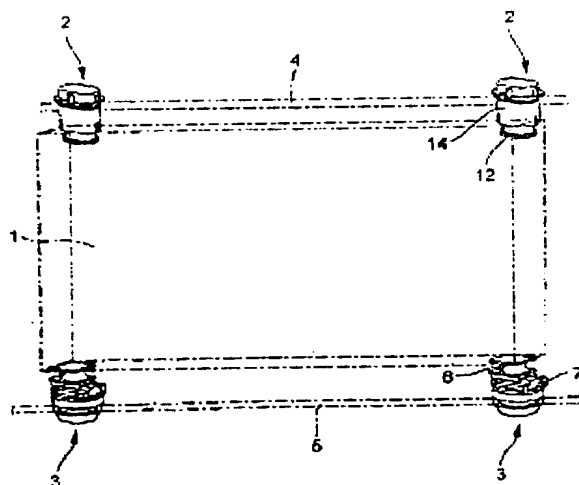
- (51) International patent classification⁷: F28F 9/00 (72) Inventors; and
(21) International application number: PCT/EP2004/003605 (75) Inventors/Applicants (US only): BRAIC, Viorel [DE/DE]; Halteiweg 10b, 70565 Stuttgart (DE). SCHEMBERA, Adolf [DE/DE]; Hauptstrasse 9, 73113 Ottenbach (DE). BECKER, Dirk [DE/DE]; Weingartenstrasse 37, 75391 Gechingen (DE). BITTNER, Stephan [DE/DE]; Friedhofstrasse 34, 70771 Leinfelden-Echterdingen (DE). ZIMMERMANN, Ralf [DE/DE]; Osterfeldstrasse 36, 70563 Stuttgart (DE).
(22) International filing date: 5 April 2004 (05.04.2004)
(25) Language of filing: German
(26) Language of publication: German
(30) Data relating to the priority: 103 15 887.1 8 April 2003 (08.04.2003) DE (74) Joint Representative: BEHR GMBH & CO. KG; Intellectual Property, G-IP, Mauserstrasse 3, 70469 Stuttgart (DE).
(71) Applicant (for all designated States except US): BEHR GMBH & CO. KG [DE/DE]; Intellectual Property, G-IP, Mauserstrasse 3, 70469 Stuttgart (DE).
(81) Designated states (unless otherwise indicated, for

[continued on next page]

As printed

(54) Title: HEAT EXCHANGER PROVIDED WITH FIXING ELEMENTS, IN PARTICULAR IN A VEHICLE

(54) Bezeichnung: WÄRMETAUSCHER MIT BEFESTIGUNGSELEMENTEN IN INSBESONDERE EINEM KRAFTFAHRZEUG



(57) Abstract: The invention relates to a heat exchanger (1) comprising fixing elements which are provided with points of fracture, in particular in a vehicle. The aim of said invention is to provide said heat exchanger with restorable points of fracture and to make it possible to easily reassemble them after the separation thereof. For this purpose, the inventive heat exchanger (1) is characterised in that at least one fixing element is provided with a first and second area (6, 7; 12, 14) and with a quick release coupling therebetween; two areas (6, 12) form an inseparable component of the heat exchanger (1); the two areas (6, 7; 12, 14) are fixable to each other by a positive connection when the quick release coupling is closed; the coupling systems of one of the areas (6, 7; 12, 14) are provided with at least one point of fracture and in that the coupling systems provided with at least one point of fracture are arranged on the area (7, 14) which is detachable from said heat exchanger.

(57) Zusammenfassung: Ein Wärmetauscher (1) mit Sollbruchstellen umfassenden Befestigungselementen, in insbesondere einem Fahrzeug, soll mit wiederherstellbaren Sollbruchstellen ausgerüstet sein und nach erfolgter Ruffrennung der Sollbruchstellen einfach remontierbar sein. Zu diesem Zweck zeichnet

[continued on next page]

WO 2004/090453 A1

every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) **Designated states** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent

(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17

- *of inventorship (Rule 4.17(iv)) for the following designation US*

Published:

- *With International Search Report.*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For an explanation of the two-letter codes and the other abbreviations, reference is made to the explanations ("Guidance Notes on Codes and Abbreviations") at the beginning of each regular edition of the PCT Gazette.

sich ein solcher Wärmetauscher (1) durch folgende Merkmale aus, - mindestens eines der Befestigungselemente umfließt einen ersten und zweiten Bereich (6, 7; 12, 14) mit einer Schnellverschlussverbindung zwischen diesen beiden Bereichen (6, 7; 12, 14), - jeweils einer der beiden Bereiche (6; 12) ist untrennbarer Bestandteil des Wärmetauschers (1), - bei geschlossener Schnellverschlussverbindung greifen die jeweils beiden Bereiche (6, 7; 12, 14) formschlüssig fixierwirkend ineinander, - die Verschlussmittel eines der beiden Bereiche (6, 7; 12, 14) sind mit mindestens einer Sollbruchstelle versehen, - das mit der mindestens einen Sollbruchstelle versehenen Verschlussmittel befindet sich an dem von dem Wärmetauscher (1) trennbaren Bereich (7, 14).